

REMARKS/ARGUMENTS

Cross-reference Objection to Specification

In paragraph 4 of the Office Action, a correction to the cross-reference information is requested again. Applicants believe these corrections were filed in the amendment dated April 7, 2004. If the corrections to the cross-reference information were not entered for some reason, please let the Applicant know and we can amend the information again.

35 U.S.C. §102/103 Rejections

The Office Action has rejected claims 1, 3, 5-6, 8-9, 11-12, 14, 16-17 and 20 under 35 U.S.C. §102(b) as being anticipated by the cited portions of the Alpha Architecture Handbook (hereinafter "Alpha"). Secondly, the Office Action has rejected claims 2, 4, 10, 15 and 18-19 under 35 U.S.C. §103(a) as being unpatentable over Alpha in view of the cited portions of U.S. Patent No. 4,833,599 to Colwell (hereinafter "Colwell"). Lastly, the Office Action has rejected claims 2, 4, 10, 15 and 18-19 under 35 U.S.C. §103(a) as being unpatentable over Alpha in view of the cited portions of Computer Organization and Design to Patterson and Hennessy (hereinafter "Patterson").

The amended claims require that at least two mathematical relationships be determined in a single compare instruction. The possible mathematical relationships are defined in claims 1 and 12 as "less than," "equal to," "greater than" and no valid relationship. In stark contrast, the Handbook has four instructions to test for four different mathematical relationships, where each instruction tests for a single mathematical relationship. The claimed invention can test for these relationships with a fraction of the instructions to be at least twice as efficient on an instruction-by-instruction basis.

As understood by the Applicant, the Office Action takes the position that a single CMPTLE instruction in the Alpha reference can determine two relationships in a single instruction. Office Action, paragraphs 8c, 16d, 19b. With all due respect, this is simply wrong. The CMPTLE instruction can only indicate a compound relationship between two numbers, but that is a single relationship. After running a CMPTLE instruction, you don't know the both

relationships of "less than" and "equal to," you only know that it is one of those. Hence, one relationship. For example, is 5 less than or equal to 6 using the CMPTLE instruction? Yes. Do we know from the answer "yes" if it is "less than?" Do we know if the numbers are "equal to?" The answer to both is no. Hence the two questions (i.e., mathematical relationships) cannot be answered in a single instruction. Indeed, the Alpha reference must also run a CMPTLT or CMPTEQ instruction to determine the answer to the two questions. Alpha, section 4.10.8, page 4-113.

The second part of the argument in the Office Action is that you can determine if the relationship is "less than or equal to" with a CMPTLT instruction and implicitly know another relationship, namely, "greater than" because they are mutually exclusive. They are not mutually exclusive. The claims require at least two of four possible relationships between two numbers be defined (i.e., less than, equal to, greater than and no valid relationship). The Alpha reference requires at least two instructions to do the same.

This is best illustrated by another example using CMPTLE to compare the numbers 5 and 5. The answer provided by this instruction is "Yes." Which of the four relationships do we know for certain after this instruction is performed? Do we know less than, equal to, and greater than? We know none of these for certain without performing a second instruction. Clearly, you cannot define two of the claimed relationships between two numbers in a single instruction using the Alpha reference.

There is an additional reason that "less than or equal to" is not mutually exclusive with "greater than." As noted in the Alpha reference, it could be that one of the numbers in the comparison is not a number (NaN) or has no valid relationship. Alpha, section 4.10.8, page 4-113, fourth paragraph from the bottom of the page. By running a CMPTLE instruction you cannot presume there is a "greater than" mathematical relationship because it could be an NaN condition that is not stored in the output register. These are not mutually exclusive as an alternative outcome is possible.

Reconsideration of the rejection is respectfully requested.

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Amdt. dated July 22, 2004  
Amendment under 37 CFR 1.116 Expedited Procedure  
Examining Group 2183

PATENT

**CONCLUSION**

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,

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